**Printed Pages: 02** **Sub Code:KEE-058**

**Paper Id:** 231467 **Roll No.** | | | | | | | | | | |

**B.TECH**
**(SEM V) THEORY EXAMINATION 2022-23**
**ANALOG AND DIGITAL COMMUNICATION**

***Time: 3 Hours*** ***Total Marks: 100***

**Note: 1.** Attempt all Sections. If require any missing data; then choose suitably.

**SECTION A**

**1. Attempt *all* questions in brief.** **2 x 10 = 20**

(a) Draw the block diagram of communication channel.
(b) Define modulation index in Amplitude modulation wave.
(c) How noise effect on the Amplitude modulation (AM) wave?
(d) Define bandwidth in Angle modulated signal.
(e) Explain the nyquist criteria for sampling.
(f) Write the advantages of pulse amplitude modulation
(g) Explain the types of digital modulation technique.
(h) Explain bit rate and bandwidth of FSK
(i) Write the advantages of time division multiplexing.
(j) Define entropy in information theory

**SECTION B**

**2. Attempt any *three* of the following:** **10 x 3 = 30**

(a) Briefly explain about the Super-heterodyne receiver and its advantages.
(b) What is frequency modulation? Explain mathematical representation of frequency modulation.
(c) Explain generation and detection methods of pulse amplitude modulation.
(d) Draw the block diagram of BPSK transmitter. Explain balanced ring modulator of BPSK.
(e) Give brief introduction about time division multiplexing? Explain synchronous and asynchronous TDM.

**SECTION C**

**3. Attempt any *one* part of the following:** **10 x 1 = 10**

(a) With the help of diagram explain generation and detection of SSB-SC wave.
(b) What is the basic concept of multiplexing? Explain frequency division multiplexing (FDM) hierarchy system.

**4. Attempt any *one* part of the following:** **10 x 1 = 10**

(a) Explain the generation of FM wave using indirect method and slop detectorfor demodulation.
(b) Drive the mathematical expression of wide band frequency modulation using Bessel function.

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**5. Attempt any *one* part of the following: 10 x 1 = 10**

(a) What is delta modulation? Explain working of adaptive delta modulation with proper block diagram
(b) Explain the generation and demodulation of pulse width modulation (PWM)?

**6. Attempt any *one* part of the following: 10 x 1 = 10**

(a) Explain briefly about the transmitter and receiver of FSK with neat and clean diagram.
(b) Discuss about the 8-bit QAM transmitter.For an 8bit-PSK system, operating with an information bit rate of 24kbps, determine (a) baud, (b) minimum bandwidth, and (c)bandwidth efficiency

**7. Attempt any *one* part of the following: 10 x 1 = 10**

(a) What should be the desirable feature of a T1 carrier system? Explain PCM-TDM system.
(b) Design a binary Huffman code for a discrete source having seven independent symbols having probabilities 0.25, 0.25, 0.125, 0.125, 0.125, 0.0625 and 0.0625 respectively. Also, calculate the efficiency of this code.

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